

Package ‘fastverse’

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Title A Suite of High-Performance Packages for Statistics and Data Manipulation

Version 0.2.3

Description Easy installation, loading and management, of a complementary set of high-performance packages for statistical computing and data manipulation. The core 'fastverse' consists of 6 packages: 'data.table', 'collapse', 'matrixStats', 'kit', 'magrittr' and 'fst', that jointly only depend on 'Rcpp'. These packages are attached and harmonized through the 'fastverse'. In addition, the 'fastverse' can be freely and permanently extended with additional packages, both globally or for individual projects. Entirely separate package verses can also be created. Selected fast and low-dependency packages are suggested for various topics such as time series, dates and times, strings, spatial data, statistics and data serialization (see GitHub / website).

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Encoding UTF-8

Imports data.table, collapse, matrixStats, kit, magrittr, fst

Suggests xts, roll, fasttime, lubridate, dygraphs, stringi, stringfish, Rfast, Rfast2, coop, rraply, qs, tidypipe, maditr, knitr, rmarkdown

URL <https://sebkrantz.github.io/fastverse/>,
<https://github.com/SebKrantz/fastverse>

BugReports <https://github.com/SebKrantz/fastverse/issues>

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Author Sebastian Krantz [aut, cre],
Hadley Wickham [ctb]

Maintainer Sebastian Krantz <sebastian.krantz@graduateinstitute.ch>

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fastverse	<i>The fastverse</i>
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Description

The *fastverse* is an extensible suite of R packages, developed independently by various people, that jointly contribute to the objectives of:

1. Speeding up R through heavy use of compiled code (C, C++, Fortran)
2. Enabling more complex statistical and data manipulation operations in R
3. Reducing the number of dependencies required for advanced computing in R

Inspired by the *tidyverse* package, the *fastverse* package is a flexible package loader and manager that allows users to put together their own 'verses' of packages and load them with `library(fastverse)`.

The *fastverse* installs 6 core packages (`data.table`, `collapse`, `matrixStats`, `kit`, `magrittr` and `fst`) that provide native C/C++ code of proven quality, work well together, and enable complex statistical computing and data manipulation - with only `Rcpp` as an additional dependency. The package also harmonizes functionality among some of these core packages (see below).

The *fastverse* further allows users to freely (and permanently) extend or reduce the number of packages in the *fastverse*. A selection of suggested high-performing packages for various topics is provided in `fastverse_extend` (and with more details in the [README](#)). Other functions help to determine joint dependencies, sort out namespace conflicts among attached packages, and update packages.

Functions in the *fastverse* Package

Functions to extend or reduce the number of packages in the *fastverse* - either for the session or permanently - and to restore defaults.

```
fastverse_extend()
fastverse_detach()
fastverse_reset()
```

Function to display conflicts for *fastverse* packages (or any other attached packages)

```
fastverse_conflicts()
```

Function to update *fastverse* packages (and dependencies) and install (missing) packages

```
fastverse_update()
fastverse_install()
```

Utilities to retrieve the names of *fastverse* packages (and dependencies), their update status and produce a situation report.

```
fastverse_packages()
fastverse_deps()
fastverse_sitrep()
```

Function to create a new extensible verse of packages like the *fastverse*

```
fastverse_child()
```

fastverse Options

- `options(fastverse.quiet = TRUE)` will disable all automatic messages (including conflict reporting) when calling `library(fastvrsers)`, `fastverse_extend`, `fastverse_update(install = TRUE)` and `fastverse_install`.
- `options(fastverse.styling = FALSE)` will disable all styling applied to text printed to the console.
- `options(fastverse.extend = c(...))` can be set before calling `library(fastvrsers)` to extend the *fastverse* with some packages for the session. The same can be done with the `fastverse_extend` function after `library(fastvrsers)`, which will also populate `options("fastverse.extend")`.
- `options(fastverse.install = TRUE)` can be set before `library(fastverse)` to install any missing packages beforehand. See also `fastverse_install`.

fastverse Harmonisations

- There are 2 internal clashes between `collapse::funique` and `kit::funique`, and between `matrixStats::count` and `kit::count`. The *collapse* and *matrixStats* versions take precedence over the *kit* versions. For a comparison of functionality see the details section of `fastverse_conflicts`.
- Quite a number of functions in the *matrixStats* package do not (by default) preserve the attributes of objects passed to them, resulting in inconsistent behavior of different functions. The GitHub version of the *fastverse* alters most of the functions where this is the case, listed in a global variable `.matrixStats_replaced`, bestowing them with capabilities to preserve matrix dimension names and other attributes (for functions returning a matrix). This is done using very efficient R and C code, so that performance does not suffer. When the *fastverse*

is attached, these altered function are replaced in the *matrixStats* namespace. Since CRAN does not allow namespace modifications in other packages, this feature is only available in the GitHub version, installable using `remotes::install_github("SebKrantz/fastverse")`. Development of CRAN and GitHub version will continue synchronous until *matrixStats* has evolved so that consistent attribute handling (`useNames = TRUE`) becomes the default.

fastverse_child *Create a new (descendant) verse of packages*

Description

Creates and installs a fully customizable descendant verse of packages that is itself extensible and inherits 90% of the functionality of the *fastverse* package.

Usage

```
fastverse_child(
  name,
  title,
  pkg,
  maintainer,
  version = "0.1.0",
  dir = ".",
  theme = c("fastverse", "tidyverse"),
  install = TRUE,
  keep.dir = TRUE,
  ...
)
```

Arguments

<code>name</code>	character. The name of the child-verse e.g. 'myMLverse'.
<code>title</code>	character. The title of the child-verse e.g. 'My Machine Learning Verse'.
<code>pkg</code>	character. A vector of core packages for the new verse.
<code>maintainer</code>	character. A quoted person statement giving the package maintainer. If you do not intend to substantially modify the code of the resulting source package, <code>role = "cre"</code> is appropriate. See Examples.
<code>version</code>	character. A quoted version number for the new package.
<code>dir</code>	character. The directory in which a source directory <code>dir/name</code> for the package will be created.
<code>theme</code>	character. Set the colour-theme for text printed to the console. The options are "fastverse" or "tidyverse".
<code>install</code>	logical. TRUE installs the package using <code>install.packages(dir/name, repos = NULL, type = "source", ...)</code> .
<code>keep.dir</code>	logical. FALSE will remove the source directory (<code>dir/name</code>) again after installation.
<code>...</code>	further arguments to install.packages .

Details

This function creates and installs a source package according to the users specification. For that it downloads the 'child' branch of the [GitHub repository](#), which was specifically set up to produce a new verse, unzips it into a source directory, and substitutes the user inputs into the files. The package is then installed from source, and (optionally) the source directory is removed again.

fastverse children inherit 90% of the functionality of the *fastverse* package: they are not permanently globally extensible and can not bear children themselves, but can be configured for projects (using a .name config file) and extended in the session. Use of this function requires an internet connection but no additional R packages (like devtools, remotes or roxygen2).

Value

fastverse_child returns NULL invisibly.

See Also

[fastverse_extend](#), [fastverse](#)

Examples

```
## Not run:

fastverse_child(
  name = "tsverse",
  title = "Time Series Package Verse",
  pkg = c("xts", "roll", "zoo", "tsbox", "urca", "tseries", "tsutils", "forecast"),
  maintainer = 'person("GivenName", "FamilyName", role = "cre", email = "your@email.com")',
  dir = "C:/Users/.../Documents",
  theme = "tidyverse")

## End(Not run)
```

fastverse_conflicts *Conflicts between the fastverse and other packages*

Description

This function lists all the conflicts among *fastverse* packages and between *fastverse* packages and other attached packages. It can also be used to check conflicts for any other attached packages.

Usage

```
fastverse_conflicts(pkg = fastverse_packages())
```

Arguments

pkg character. A vector of packages to check conflicts for. The default is all *fastverse* packages.

Details

There are 2 internal conflict in the core *fastverse* which are not displayed by `fastverse_conflicts()`:

- `collapse::funique` masks `kit::funique`. If both packages are detached, *collapse* is attached after *kit*. In general, the *collapse* version is often faster on data frames and supports unique rows on selected columns. An option `sort = TRUE` lets `collapse::funique` return sorted unique values. The *kit* version is often faster for vectors and also supports matrices.
- `matrixStats::count` masks `kit::count`. The *matrixStats* version is more flexible, supporting restricted search and missing value removal. The *kit* version is nearly twice as fast.

Value

An object of class 'fastverse_conflicts': A named list of character vectors where the names are the conflicted objects, and the content are the names of the package namespaces containing the object, in the order they appear on the [search](#) path.

See Also

[fastverse](#)

Examples

```
# Check conflicts between fastverse packages and all attached packages
fastverse_conflicts()

# Check conflicts among all attached packages
fastverse_conflicts(rm_stub(search()[-1], "package:"))
```

fastverse_deps	<i>List all fastverse dependencies</i>
----------------	--

Description

Lists all *fastverse* dependencies and the local and CRAN versions of packages and dependencies.

Usage

```
fastverse_deps(
  pkg = fastverse_packages(),
  recursive = FALSE,
  repos = getOption("repos"),
  include.self = FALSE,
  check.deps = TRUE
)
```

Arguments

pkg	character vector of packages to check dependencies and versions of. The default is all <i>fastverse</i> packages.
recursive	logical. TRUE recursively determines all packages required to operate these packages. FALSE will only list the packages and their direct dependencies.
repos	the repositories to use to check for updates. Defaults to <code>getOption("repos")</code> .
include.self	logical. TRUE also includes the <i>fastverse</i> package and checks against the CRAN version.
check.deps	logical. FALSE will not determine dependencies but only display the update status of packages in pkg.

Value

A data frame giving the package names, the CRAN and local version, and a logical variable stating whether the local version is behind the CRAN version.

See Also

[fastverse_sitrep](#), [fastverse](#)

fastverse_detach	<i>Detach fastverse packages</i>
------------------	----------------------------------

Description

Detaches *fastverse* packages, removing them from the [search](#) path.

Usage

```
fastverse_detach(
  ...,
  unload = FALSE,
  force = FALSE,
  include.self = TRUE,
  session = FALSE,
  permanent = FALSE
)
```

Arguments

...	comma-separated package names, quoted or unquoted, or vectors of package names. If left empty, all packages returned by fastverse_packages are detached.
unload	logical. TRUE also unloads the packages using detach(name, unload = TRUE) .

force	logical. should a <i>fastverse</i> package be detached / unloaded even though other attached packages depend on it?
include.self	logical. TRUE also includes the <i>fastverse</i> package - only applicable if ... is left empty.
session	logical. TRUE also removes the packages from options("fastverse.extend"), so they will not be attached again with library(<i>fastverse</i>) in the current session. If ... is left empty and include.self = TRUE, this will clear all <i>fastverse</i> options set for the session.
permanent	logical. if ... are used to detach certain packages, permanent = TRUE will disable them being loaded the next time the <i>fastverse</i> is loaded. This is implemented via a config file saved to the package directory. Core <i>fastverse</i> packages can also be detached in this way. To add a package again use extend_fastverse(..., permanent = TRUE). The config file can be removed with fastverse_reset .

Value

fastverse_detach returns NULL invisibly.

See Also

[fastverse_extend](#), [fastverse](#)

fastverse_extend	<i>Extend the fastverse</i>
------------------	-----------------------------

Description

Loads additional packages as part of the *fastverse*. By default only for the session, but extensions can be saved up to reinstallation/updating of the *fastverse* package.

Usage

```
fastverse_extend(
  ...,
  topics = NULL,
  install = FALSE,
  permanent = FALSE,
  check.conflicts = !isTRUE(getOption("fastverse.quiet"))
)
```

Arguments

...	comma-separated package names, quoted or unquoted, or vectors of package names.
topics	integer or character. Short-keys to attach groups of related and packages suggested as extensions to the <i>fastverse</i> (not case sensitive if character). Unavailable packages are skipped unless install = TRUE.

1. "TS": Time Series. Attaches *xts*, *zoo* and *roll*.
2. "DT": Dates and Times. Attaches *lubridate*, *anytime*, *fasttime*, *nanotime*, *clock*, and *timechange*.
3. "ST": Strings. Attaches *stringr*, *stringi*, *snakecase*, *stringfish* and *stringdist*.
4. "SC": Statistics and Computing. Attaches *Rfast*, *Rfast2*, *parallelDist*, *coop*, *MatrixExtra*, *rsparse* and *rrapply*.
5. "SP": Spatial. Attaches *sf*, *stars* and *terra*.
6. "VI": Visualization. Attaches *dygraphs*, *ggplot2*, *scales*, *lattice* and *grid*.
7. "TV": Tidyverse-Like. Attaches *tidytable*, *tidyfast*, *tidyfst*, *tidyft* and *ma-ditr*.
8. "IO": Input-Output. Attaches *qs* and *arrow*.

<code>install</code>	logical. Install packages not available?
<code>permanent</code>	logical. Should packages be saved and included when <code>library(fastverse)</code> is called next time? Implemented via a config file saved to the package directory. The file will be removed if the <i>fastverse</i> is reinstalled, and can be removed without reinstallation using <code>fastverse_reset</code> . Packages can be removed from the config file using <code>fastverse_detach(..., permanent = TRUE)</code> .
<code>check.conflicts</code>	logical. Should conflicts between extension packages and attached packages be checked?

Details

The *fastverse* can be extended using a free choice of packages, packages listed under topics, or a combination of both. If `install = FALSE`, only packages among the topics groups that are available are considered, others are disregarded.

When the *fastverse* is extended calling `fastverse_extend(...)`, the packages that are not attached are attached, but conflicts are checked for all specified packages. If `permanent = FALSE`, an `options("fastverse.extend")` is set which stores these extension packages, regardless of whether they were already attached or not. When calling `fastverse_packages`, `fastverse_deps`, `fastverse_conflicts`, `fastverse_update`, `fastverse_sitrep` or `fastverse_detach`, these packages are included as part of the *fastverse*. This is also the case if `permanent = TRUE`, with the only difference that instead of populating the option, a file is saved to the package directory such that the packages are also loaded (as part of the core *fastverse*) when calling `library(fastverse)` in the next session. To extend the *fastverse* for the current session when it is not yet loaded, users can also set `options(fastverse.extend = c(...))`, where `c(...)` is a character vector of package names, before calling `library(fastverse)`.

Value

`fastverse_extend` returns `NULL` invisibly.

See Also

[fastverse_detach](#), [fastverse](#)

Examples

```
ex <- getOption("fastverse.extend")
fastverse_extend(xts, stringi)
fastverse_extend(fasttime, topics = "VI")

# Undoing this again
fastverse_detach(setdiff(getOption("fastverse.extend"), ex), session = TRUE)
rm(ex)
```

fastverse_install *Install (missing) fastverse packages*

Description

This function (by default) checks if any *fastverse* package is missing and installs the missing package(s).

Usage

```
fastverse_install(..., only.missing = TRUE, install = TRUE)
```

Arguments

...	comma-separated package names, quoted or unquoted, or vectors of package names. If left empty, all packages returned by fastverse_packages are checked.
only.missing	logical. TRUE only installs packages that are unavailable. FALSE installs all packages, even if they are available.
install	logical. TRUE will proceed to install packages, whereas FALSE (recommended) will print the installation command asking you to run it in a clean R session.

Value

fastverse_install returns NULL invisibly.

Note

There is also the possibility to set `options(fastverse.install = TRUE)` before `library(collapse)`, which will call `fastverse_install()` before loading any packages to make sure all packages are available. If you are using a `.fastverse` configuration file inside a project (see vignette), you can also place `_opt_fastverse.install = TRUE` before the list of packages in that file.

See Also

[fastverse_update](#), [fastverse](#)

fastverse_packages *List all packages in the fastverse*

Description

Core packages are first fetched from a project-level configuration file (if found), else from a global configuration file (if found), otherwise the standard set of core packages is returned. In addition, if `extensions = TRUE`, any packages used to extend the *fastverse* for the current session are also returned.

Usage

```
fastverse_packages(extensions = TRUE, include.self = TRUE)
```

Arguments

`extensions` logical. TRUE appends the set of core packages with all packages found in `options("fastverse.extend")`.

`include.self` logical. Include the *fastverse* package in the list?

Value

A character vector of package names.

See Also

[fastverse_extend](#), [fastverse](#)

Examples

```
fastverse_packages()
```

fastverse_reset *Reset the fastverse to defaults*

Description

Calling this function will remove global configuration files and (default) clear all package options. Attached packages will not be detached, and configuration files for projects (as discussed in the vignette) will not be removed.

Usage

```
fastverse_reset(options = TRUE)
```

Arguments

options logical. TRUE also clears all *fastverse* options.

Value

fastverse_reset returns NULL invisibly.

See Also

[fastverse_extend](#), [fastverse](#)

fastverse_sitrep *Get a situation report on the fastverse*

Description

This function gives a quick overview of the version of R and all *fastverse* packages (including availability updates for packages) and indicates whether any global or project-level configuration files are used (as described in more detail the vignette).

Usage

```
fastverse_sitrep(...)
```

Arguments

... arguments other than pkg passed to [fastverse_deps](#).

Value

fastverse_sitrep returns NULL invisibly.

See Also

[fastverse_deps](#), [fastverse](#)

fastverse_update	<i>Update fastverse packages</i>
------------------	----------------------------------

Description

This will check all *fastverse* packages (and their dependencies) for updates and (optionally) install those updates.

Usage

```
fastverse_update(..., install = FALSE)
```

Arguments

...	arguments passed to fastverse_deps .
install	logical. TRUE will proceed to install outdated packages, whereas FALSE (recommended) will print the installation command asking you to run it in a clean R session.

Value

fastverse_update returns NULL invisibly.

See Also

[fastverse_deps](#), [fastverse](#)

is_attached	<i>Utilities</i>
-------------	------------------

Description

Checks if packages are installed or attached.

Usage

```
is_attached(x)  
  
is_installed(x)
```

Arguments

x	character. A vector of package names.
---	---------------------------------------

Value

A named logical vector.

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